REMARKS

In response to the Office Action mailed October 20, 2006, Applicant respectfully requests reconsideration.

Claims 1, 14, 15, 24 are amended; claims 4-5, 13, 26, 30, 33 are cancelled; claims 36-37 are new. Specifically, the subject matter of cancelled claim 5 is added to claim 1, and the subject matter of cancelled claim 26 is added to claim 24. Claims 1-3, 6-12, 14-25, 27-29, 31-32 and 34-37 are pending, of which claims 1 and 24 are independent claims.

Preliminary Matters

The withdrawal of the previous rejection based on Seguin is acknowledged.

Claim Rejections

In the Office Action, claims 1-4, 6, 8-10, 18-19, 21-22, 24-25, 27-29, 31-32, and 34-35 are rejected under 35 U.S.C. § 102(b) as being anticipated by Reilly (US 6,215,807). Also, claims 1 and 20-23 are rejected under 35 U.S.C. § 102(b) as being anticipated by Sziklas; claim 7 is rejected under 35 U.S.C. § 103(a) as being obvious in view of Reilly; claims 5, 15, 17 and 26 are rejected under 35 U.S.C. § 103(a) as being obvious in view of Reilly in combination with Tanuma (US 5,561,550); claims 5, 14 and 16 are rejected under 35 U.S.C. § 103(a) as being obvious in view of Reilly in combination with Velsko (US 6,421,166); claim 13 is rejected under 35 U.S.C. § 103(a) as being obvious in view of Reilly in combination with Vetrovec (US 2002/0172253); and claims 11-12 are rejected under 35 U.S.C. § 103(a) as being obvious in view of Reilly in combination with Vetrovec and Mooradian (US 5,115,445).

It is respectfully submitted that all these rejections with the exception of the Reilly/Tanuma and Reilly/Velsko rejections are no longer applicable due to the amendment of the claims herein. The Reilly/Tanuma and Reilly/Velsko

rejections are respectfully traversed with respect to the claims as amended herein.

Claim 1 as amended recites a system for coherent beam combination that includes at least two gain media located within an unstable resonator, wherein (1) a first electromagnetic field produced by a first gain medium propagates through a portion of a second gain medium after one or more roundtrips within the unstable resonator; (2) the first electromagnetic field is in-phase with a second electromagnetic field produced by the second gain medium; (3) the at least two gain media are placed in a plane transverse to a longitudinal axis of the unstable resonator, each gain medium being positioned an equal distance away from and on a different side of the longitudinal axis of the unstable resonator; and (4) the at least two gain media are parametric gain media.

Reilly, as noted in the Office Action, does not teach the use of parametric gain media. The system of Reilly appears to be limited to the use of a lasing medium, and in particular a gaseous lasing medium disposed in gaps 12 between so-called "slabs" 10 (see col. 7 ll. 1-14). The lasing medium fills the resonant cavity. Nowhere is Reilly seen to suggest any alternative to such a cavity-filling gaseous lasing medium.

Tanuma shows an unstable optical resonator that employs a nonlinear optical medium 20 such as lithium niobate. However, Tanuma is seen to show only one such medium 20 disposed in the optical resonator.

Velsko is seen to teach a parametric wavelength converter that employs a single QPMC crystal 24 arranged between mirrors 20 and 22.

It is respectfully submitted that neither the combination of Reilly and Tanuma nor the combination of Reilly and Velsko teaches or suggests all the elements of claim 1, and therefore neither of these combinations can render claim 1 obvious under 35 U.S.C. § 103(a). Specifically, neither of these combinations is seen to teach or suggest system having an optical resonator and at least two parametric gain media placed in a plane transverse to a longitudinal axis of the unstable resonator, each gain medium being positioned an equal

distance away from and on a different side of the longitudinal axis of the unstable resonator. Reilly teaches only a gaseous lasing medium, and not parametric gain media. Moreover, Reilly's lasing medium is a single medium filling the entire resonator cavity, with lasing occurring in the gaps 12 between the slabs 10. Both Tanuma and Velsko teach the use of a single medium. Thus nowhere in any of these references is there a suggestion of using at least two parametric gain media in the configuration recited in claim 1. Accordingly, claim 1 is not obvious in view of either of these combinations of references.

It is desired to address the brief reference in the Office Action to the teaching of Benda (US 5,173,907), which is alleged in the Office Action to teach at col. 3 ll. 43-45 "the obviousness of replacing a gas gain media with that of a solid-state type". It is noted that Benda's teaching is limited to lasers, and thus this statement in Benda refers only to the use of solid state laser media and not to parametric media. There is not seen to be any discussion in Benda of the use of parametric media, and thus Benda is not seen to overcome the above-noted shortcomings of the Reilly/Tanuma and Reilly/Velsko combinations.

It will be appreciated that the remaining claims incorporate, either directly or indirectly, features similar to those discussed above, and are therefore seen to be allowable over the art of record for at least the above reasons. Claim 24 and its dependent claims recite the generation of signal and idler fields, which are known to be specific to parametric optical amplification as distinct from lasing.

Based on the above, it is respectfully submitted that all the claims of this application are allowable over the art of record, and therefore this application is in condition for allowance. Favorable action is respectfully requested.

Newly Added Claims

Claims 36-37 have been added and are believed to be in allowable condition. Support for these claims is provided within the Specification, for example, in Figures 2 and 4 and related text. No new matter has been added. It is noted that Reilly does not employ a circular cross section, and further that

where a circular cross section is utilized (e.g. Sziklas) the gain media are not disposed between convex and concave mirrors as recited in claim 37.

Conclusion

In view of the foregoing remarks, this Application should be in condition for allowance. A Notice to this affect is respectfully requested. If the Examiner believes, after this Response, that the Application is not in condition for allowance, the Examiner is respectfully requested to call the Applicant's Representative at the number below.

Applicant hereby petitions for any extension of time which may be required to maintain the pendency of this case. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 50-3661.

If the enclosed papers or fees are considered incomplete, the Patent Office is respectfully requested to contact the undersigned collect at (508) 616-2900, in Westborough, Massachusetts.

Respectfully submitted,

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